My file: P 85/9 rö

Laser Protective Wall

The invention is concerned with a protective wall for shielding against laser beams, in particular those stemming from welding machines, wherein the protective wall contains light-alloy shaped sections that are essentially rectangular and incorporates chambers that are formed by interior walls, and profilings that are formed on the front and/or side.

Laser protective walls of this type are known from DE 198 55 793.0. In these, the shaped sections are joined to create frames in each case, which are equipped in the grooves with fitted sheet metal plates. This type of construction has the shortcoming that the walls consist of large-surface framed plate elements, and assembly of every protective cabin therefore requires fitting the wall elements, and repair of a wall that has been damaged during rough workshop operations, or relocation or modification of a cabin built therefrom is very time consuming and generally entails wasted shaped section and plate material.

It is the object of the invention to create a simple protective wall system that considerably facilitates the setup, a modification, and a repair.

This object is met in such a way that the light-alloy shaped sections are lined up and connected side wall to side wall in an individually removable manner to form the protective wall in such a way that the profiling on the side is implemented step-like from a front wall to a back wall.

Advantageous embodiments are specified in the subclaims.

The step-like profiling advantageously incorporates strip projections on one hand and matching grooves on the other hand, which are oriented toward the respective front or back of the wall.

The given hook-shaped strip projections that are spaced further apart preferably continue into the front wall, and strip projections that are spaced closer together extend either as a free side wall segment or hook-shaped adjacent to the side wall and end in each case recessed by approximately the wall thickness behind the front or back wall. In this manner a smooth front or back of the protective wall is obtained when the tongues are inserted and pushed into the grooves.

Advantageously there are shaped sections of different widths, as well as a corner element, the front and back wall of which are angled so that the side walls that serve to create the connection are located at a right angle to one another.

In addition to the hook-shaped strip connectors, the side walls additionally have preferably undercut grooves, in which wall plates, door hinges, etc., can be held like in the previously known protective wall system.

The front wall preferably has in its side regions undercut grooves in which connecting and/or finishing plates can be held frictionally or locked in place. The finishing plates preferably extend from one shaped section to the adjacent shaped section and thus create an additional connection. The outer face of the finishing plates is preferably shaped corrugated. The finishing plates are advantageously extruded from light alloy with their clamping hooks and front profiling.

The wall thickness is 80 mm, for example, and the spacing of the front grooves advantageously corresponds to half the wall thickness.

In the additional described examples, the shaped sections are placed vertically. However, they may also be lined up horizontally in such a way that they are held removably, e.g., screwed in, from one side in vertical connecting sections. In this arrangement, too, one or two shaped sections can be unscrewed, removed and replaced, since the connecting sections are provided only on the one side. The stepping of the side walls prevents a laser beam from penetrating through gaps caused by tolerances, which occur between the shaped sections, and additionally permits removal and replacement of individual shaped sections from one side.

Advantageous embodiments are presented in Figs. 1 and 2.

Fig. 1 shows a wall segment with a corner shaped section;

Fig. 2 shows a wall segment of short elements.

Fig. 1 shows a protective wall segment 1 of flat shaped sections 10, 11, and 12, and a corner shaped section 15, which are provided through intermediate walls 2 with hollow chambers. The side walls 20 - 25 of the shaped sections 10 - 12, 15 each incorporate near the front wall 26 and back wall 27 of the shaped section interlocking tongue and groove connections, which are formed by free-standing or hook-shaped strip projections 41A - 43A; 50 - 53 with an adjoining groove 40 - 45 in each case. On adjoining shaped sections 10, 11, 12, the tongues are oriented alternating with the grooves in each case toward the respective front or back of the wall so that the shaped sections can alternately be removed and replaced either from the front or from the back. Once two shaped sections have been removed toward one side, all shaped sections located in-between can also be freely removed. In the same way, with a corresponding sequence of the shaped sections, the assembly can also be performed from any random side.

The strip projections 41A, 43 A on the side of the side walls 20, 21 from which the shaped section 11 is to be inserted are graduated wider by the tongue and groove width W, M, than the strip projections 40A, 42A on the opposite front 26.

The strip projections 41A, 43A that are located further out preferably extend hook-like from the free wall 27. The more closely spaced strip projections 40A, 42A; 53, 55 extend as free ends of the side walls 20, 21, or hook-shaped parallel thereto. The ends of the more closely spaced strip projections are recessed in each case from the front or back wall 26, 27 by one material thickness M, so that

when the strip projections 50, 53 are pushed into the bottom of the grooves, the front and back 26, 27 of the shaped sections 10, 12, are flush in each case.

The side walls 20, 21, incorporate centrically undercut grooves 31, 33, which may optionally receive wall plates, door connections, etc.

On the front 26, additional undercut grooves 30, 32, 34 are formed in both end regions. They serve to either receive connecting elements or, as shown, finishing plates 60, which are held frictionally or locked in place with spring elements 61, 62 on the groove edges. The plate front is provided with a profiling 63.

The given adjacent grooves 32, 34 on the front have a center distance A of approximately half the wall thickness WD, which is 80 mm, for example.

The shown corner shaped section 15 incorporates on the side walls 25 the corresponding tongue-and-groove arrangement 44, 44A, 45, 45A, into which the strip projections 54, 55 of the adjoining flat shaped section 12 engage.

The many varied requirements for cabin construction are met with shaped sections 10 - 14 of different widths B1, B2. In addition to the 200 mm wide shaped sections 10 - 12 shown in Fig. 1, shaped sections 13, 14, of 40 mm width B2 are shown in Fig. 2 in an enlarged scale. Since the width across the corner E of the corner piece 15, Fig. 1, is also 40 mm, the cabins can be assembled in a 40 mm modular dimension on the inside and outside.

The surfaces of the shaped sections and wall elements are advantageously provided with an anodized or chromate coating in a known manner, whereby penetration of the laser beams through the various wall layers is impeded.

List of Reference Numerals

1	Protective Wall
2	Interior Walls
10, 11, 12, 13, 14	Shaped Sections
15	Corner Shaped Section
20, 21, 22, 23, 24, 25	Side Walls
26	Front Wall
27	Back Wall
30, 31, 32, 33, 34, 35	Grooves
40, 41, 42, 43, 44, 45	Grooves
40A, 41A, 42A, 43A	Strip Projections
50, 51, 52, 53, 54, 55	Strip Projections
60	Finishing Plates
61, 62	Spring Elements
63	Shaped Ring Section
A	Groove Center Distance
B1, B2	Widths of Shaped Sections
E	Width across Corners
M	Material Thickness, Strip Width
W	Groove Width
WD	Wall Thickness